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09/956,916	09/21/2001	Luc Ouellet	12110-US	2645

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[REDACTED] EXAMINER

MEEKS, TIMOTHY HOWARD

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

1762

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DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/956,916	OUELLET ET AL.	
	Examiner Timothy H. Meeks	Art Unit 1762	
<i>-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --</i>			
Period for Reply			
A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.			
<ul style="list-style-type: none"> - Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication. - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely. - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication. - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). - Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b). 			
Status			
1) <input type="checkbox"/> Responsive to communication(s) filed on _____.			
2a) <input type="checkbox"/> This action is FINAL . 2b) <input checked="" type="checkbox"/> This action is non-final.			
3) <input type="checkbox"/> Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11, 453 O.G. 213.			
Disposition of Claims			
4) <input checked="" type="checkbox"/> Claim(s) <u>1-20</u> is/are pending in the application.			
4a) Of the above claim(s) _____ is/are withdrawn from consideration.			
5) <input type="checkbox"/> Claim(s) _____ is/are allowed.			
6) <input checked="" type="checkbox"/> Claim(s) <u>1-20</u> is/are rejected.			
7) <input type="checkbox"/> Claim(s) _____ is/are objected to.			
8) <input type="checkbox"/> Claim(s) _____ are subject to restriction and/or election requirement.			
Application Papers			
9) <input type="checkbox"/> The specification is objected to by the Examiner.			
10) <input checked="" type="checkbox"/> The drawing(s) filed on <u>21 September 2001</u> is/are: a) <input checked="" type="checkbox"/> accepted or b) <input type="checkbox"/> objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).			
11) <input type="checkbox"/> The proposed drawing correction filed on _____ is: a) <input type="checkbox"/> approved b) <input type="checkbox"/> disapproved by the Examiner. If approved, corrected drawings are required in reply to this Office action.			
12) <input type="checkbox"/> The oath or declaration is objected to by the Examiner.			
Priority under 35 U.S.C. §§ 119 and 120			
13) <input type="checkbox"/> Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). a) <input type="checkbox"/> All b) <input type="checkbox"/> Some * c) <input type="checkbox"/> None of: 1. <input type="checkbox"/> Certified copies of the priority documents have been received. 2. <input type="checkbox"/> Certified copies of the priority documents have been received in Application No. _____. 3. <input type="checkbox"/> Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)). * See the attached detailed Office action for a list of the certified copies not received.			
14) <input type="checkbox"/> Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application). a) <input type="checkbox"/> The translation of the foreign language provisional application has been received.			
15) <input type="checkbox"/> Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.			
Attachment(s)			
1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)		4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____.	
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)		5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)	
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> .		6) <input type="checkbox"/> Other: _____.	

DETAILED ACTION

Claim Objections

Claims 9, 13, 14, and 17 are objected to because of the following informalities: In claim 9, line 1, “carried” should be “carrier”. In claim 13, line 4, “.2” should be deleted after “6.00”. In claim 14, line 2, “2” should be deleted after “3.15”. In claim 17, line 1, “17..,” should be “17.”.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a process consisting essentially of setting a SiH₄ flow rate of 0.20 std litre/min, setting a N₂O flow rate of 6.00 std litre/min, setting a N₂ flow rate of 3.15 std litre/min, setting a PH₃ flow rate of 0.50 std litre/min, setting the deposition pressure at 2.60 Torr, depositing a silica film by PECVD under these conditions, and performing a heat treatment of the deposited silica film for 30 minutes in a nitrogen ambient at a temperature between 600° C to 900°C, does not reasonably provide enablement for depositing a silica film by PECVD using any raw material and oxidation gases with any flow rates, any flow rate of carrier gas, no use of a dopant gas, use of any deposition pressure and post deposition heat treatment at any temperature for any amount of time to “optimize the mechanical properties without affecting the optical

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properties". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

Applicants' process appears to rely on performing heat treatment at temperatures and times which allow the use of regions "B1, B2, B3, C1, and C2 of figure 10 to minimize stress-related damages or what appears to constitute "to optimize the mechanical properties" as claimed (see specification at 00135). These regions fall within heat treatment temperatures being between about 600 to 900 °C using a nitrogen heating ambient. Starting a paragraph 00126, the specification sets forth an explanation of the process deemed to be the inventive process wherein silica films were deposited by PECVD by setting a SiH₄ flow rate of 0.20 std litre/min, setting a N₂O flow rate of 6.00 std litre/min, setting a N₂ flow rate of 3.15 std litre/min, setting a PH₃ flow rate of 0.50 std litre/min, setting the deposition pressure at 2.60 Torr, and performing a heat treatment of the deposited silica film for 30 minutes in a nitrogen ambient at temperatures ranging from 600° C to 900°C. FTIR was used to examine the films and the optical properties of the films were assessed based upon the presence or absence of certain FTIR oscillators before and after the heat treatments.

The FTIR oscillators are clearly dependent upon the materials in the film and the manner in which those materials are bonded. The material in the film and its bonding, in turn, depends greatly upon the particular raw materials used to form the film, along with their relative amounts (flow rates), the conditions present for reaction of the materials to form the film (pressure, temperature, plasma power and type), and the heat treatment temperature and atmosphere of the deposited film which may cause further reaction or decomposition of components in the film.

This is evidenced by the description given in the specification where it shown that a difference in the deposition pressure from 2.60 torr to 2.40 torr resulted in undesirable results (see paragraphs 00129, 00130, 00132, and 00135 of the specification regarding discussion of FTIR oscillators in the film when deposited at 2.40 torr versus 2.60 torr). Therefore, the described process is extremely sensitive to even very small changes in the process conditions and results obtained when making even small changes in these conditions are unpredictable. As such, given the sensitivity of the process results on even the smallest changes in process conditions and the unpredictability of the results based on these small changes, it would require an undue amount of experimentation in order to practice the entire scope as encompassed by applicants' claims which cover any raw material, any oxidation gas, both at any flow rate, any flow rate of carrier gas, the use of no dopant or of any dopant at any flow rate, any deposition pressure, and any heat treatment time and temperature.

It is further noted that the claimed process does not even require using FTIR characteristics of the deposited film to determine desirable optical properties. Claims 3 and 18 claim monitoring "observed FTIR characteristics of the film to determine an "optimum post deposition heat treatment temperature", however, the FTIR described in the specification are for certain oscillators and these do not even appear to determine the heat treatment temperature but rather the acceptability of the optical properties of the film. Again, to practice the entire scope of the invention without using the described process wherein certain FTIR oscillators are observed for their absence or presence in the deposited film would require an undue amount of experimentation.

Given the unpredictability of process changes on the results, the lack of example other than the one under the conditions described at paragraph 00126, the extreme breadth of the claims in relation to the enabled disclosure, and the lack of prior art pertaining to the described process, it would require an undue amount of experimentation to practice the entire scope of the claimed invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 13 are confusing. Exactly which mechanical properties are to be optimized by the heat treatment? Also, “optimization” is relative to the intended goal to be achieved, of which none is defined. Therefore, it is unclear what it means to “optimize” undefined “mechanical properties” of an undefined component without an intended purpose of the optimization or frame of reference therefore. These claims are also confusing given the term “without affecting the optical properties determined in steps a to d” when no determination of optical properties was made in steps a to d. Steps a to d only require setting flow rates and pressures. No optical property of any component is mentioned whatsoever.

Claims 3 and 18 are likewise confusing. When does the monitoring of “observed FTIR characteristics” take place in relation to the process described in claims 1 and 13 (e.g., during film deposition, after film deposition, after heat treatment)? Which characteristics are referred to and

how are these used to determine “optimum post heat treatment temperature? Optimum for what purpose?

In claim 9, the Markush language is improper in that the word “or” in the last line should be “and”.

Claim Interpretation

Given the extremely confusing and non-enabled nature of the claims as described above, the only useful search of the prior art that could be performed is of a process as described in the working example at paragraph 00126 of the specification. Therefore, a process of the following metes and bounds was searched:

A method of depositing an optical quality silica film by PECVD consisting essentially of setting a SiH₄ flow rate of 0.20 std litre/min, setting a N₂O flow rate of 6.00 std litre/min, setting a N₂ flow rate of 3.15 std litre/min, setting a PH₃ flow rate of 0.50 std litre/min, setting the deposition pressure at 2.60 Torr, depositing a silica film by PECVD under these conditions, and performing a heat treatment of the deposited silica film for 30 minutes in a nitrogen ambient at a temperature between 600° C to 900°C.

Allowable Subject Matter

The process as searched would be allowable if claimed. The prior art shows PECVD of optical quality silica films using gas mixtures of silane, N₂O and PH₃ and post deposition heat treatment of such films, however, use of the flow rates, pressure, and heat treatment conditions

as searched were not disclosed or fairly suggested by the prior art. As discussed above, the values for these parameters are critical as evidenced by the difference in results obtained using even a difference of 0.2 torr deposition pressure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy H. Meeks whose telephone number is (703) 308-3816. The examiner can normally be reached on Mon., Tues., Thurs.(6-6:30), Fri.(6:30-10:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Timothy H. Meeks
Primary Examiner
Art Unit 1762

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June 30, 2003